IN THE CLAIMS:

1. (Currently Amended) A membrane electrode assembly for use in a direct oxidation fuel cell comprising:

a barrier layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and carbonaceous fuel;

first and second protonically conductive membranes disposed, respectively, on opposite surfaces of said barrier layer;

selected sites comprising openings providing passages through said barrier layer enabling protonically conductive contact through said passages between said first and second membranes, said passages being large enough relative to barrier layer thickness to enable the protonically conductive contact through said barrier layer, while said passages are small enough to substantially prevent the passage of liquid therethrough;

first and second catalysts disposed, respectively, on the surfaces of said membranes which are not in contact with said barrier layer; and

first and second diffusion material layers disposed, respectively, on the surfaces of said catalysts which are not in contact with said membranes.

2. (Previously Presented) The assembly as in claim 1 wherein said barrier layer comprises a microporous material.

3. (Currently Amended) [[The assembly as in claim 1 wherein]] A membrane electrode assembly for use in a direct oxidation fuel cell comprising:

a barrier layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and carbonaceous fuel, said barrier layer comprising a polyester microfilm with microperforations[[.]];

first and second protonically conductive membranes disposed, respectively, on opposite surfaces of said barrier layer;

selected sites comprising openings providing passages through said barrier layer enabling protonically conductive contact through said passages between said first and second membranes;

first and second catalysts disposed, respectively, on the surfaces of said membranes which are not in contact with said barrier layer; and

first and second diffusion material layers disposed, respectively, on the surfaces of said catalysts which are not in contact with said membranes.

4. (Currently Amended) [[The assembly as in claim 1 wherein]]A membrane electrode assembly for use in a direct oxidation fuel cell comprising:

a barrier layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and carbonaceous fuel, said barrier layer comprising a polyimide film with microperforations;

first and second protonically conductive membranes disposed, respectively, on opposite surfaces of said barrier layer;

selected sites comprising openings providing passages through said barrier layer enabling protonically conductive contact through said passages between said first and second membranes;

first and second catalysts disposed, respectively, on the surfaces of said membranes which are not in contact with said barrier layer; and

first and second diffusion material layers disposed, respectively, on the surfaces of said catalysts which are not in contact with said membranes said barrier layer comprises a polyimide film with microperforations.

5. (Original) The assembly as in claim 1 wherein said assembly is used in a direct methanol fuel cell.

6. (Currently Amended) A layered membrane for use in a direct oxidation fuel cell comprising:

a barrier layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and carbonaceous fuel; and

first and second protonically conductive membranes disposed, respectively, on opposite surfaces of said barrier layer; and

selected sites comprising openings providing passages through said barrier layer enabling protonically conductive contact through said passages between said first and second membranes, said passages being large enough relative to barrier layer thickness to enable the protonically conductive contact through said barrier layer, while said passages are small enough to substantially prevent the passage of liquid therethrough.

7. (Previously Presented) The membrane as in claim 6 wherein said barrier layer comprises a microporous material.

8. (Currently Amended) [[The membrane as in claim 6 wherein]] A layered membrane for use in a direct oxidation fuel cell comprising:

a barrier layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and carbonaceous fuel, said barrier layer comprising a polyester microfilm with microperforations[[.]];

first and second protonically conductive membranes disposed, respectively, on opposite surfaces of said barrier layer; and

selected sites comprising openings providing passages through said barrier layer enabling protonically conductive contact through said passages between said first and second membranes.

9. (Currently Amended) [[The membrane as in claim 6 wherein]] A layered membrane for use in a direct oxidation fuel cell comprising:

a barrier layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and carbonaceous fuel, said barrier layer comprising a polyimide film with microperforations[[.]];

first and second protonically conductive membranes disposed, respectively, on opposite surfaces of said barrier layer; and

selected sites comprising openings providing passages through said barrier layer enabling protonically conductive contact through said passages between said first and second membranes.

10. (Original) The membrane as in claim 6 wherein said membrane is used in a direct methanol fuel cell.

11. (Currently Amended) A method of constructing a layered membrane for use in a direct oxidation fuel cell comprising the steps of:

providing a layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and carbonaceous fuel; and

providing, on opposite sides of said layer, protonically conductive membranes;

and providing sites that include passages for protons to pass through said layer which allow protonically conductive contact between said protonically conductive membranes, said passages being large enough relative to barrier layer thickness to enable the protonically conductive contact through said barrier layer, while said passages are small enough to substantially prevent the passage of liquid therethrough.

12. (Original) The method as in claim 11 wherein said layer comprises a microporous material.

13. (Currently Amended) [[The method as in claim 11 wherein]] A method of constructing a layered membrane for use in a direct oxidation fuel cell comprising the steps of:

providing a layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and carbonaceous fuel, wherein said layer comprises a polyester microfilm with microperforations[[.]]; and

providing, on opposite sides of said layer, protonically conductive membranes;

and providing sites that include passages for protons to pass through said layer which allow protonically conductive contact between said protonically conductive membranes.

14. (Currently Amended) [[The method as in claim 11 wherein]] A method of constructing a layered membrane for use in a direct oxidation fuel cell comprising the steps of:

providing a layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and carbonaceous fuel, wherein said layer comprises a polyimide film with microperforations[[.]]; and

providing, on opposite sides of said layer, protonically conductive membranes; and providing sites that include passages for protons to pass through said layer which allow protonically conductive contact between said protonically conductive membranes.

15. (Currently Amended) A method of constructing a membrane electrode assembly for use in a direct oxidation fuel cell comprising the steps of:

providing a barrier layer of material which is substantially impermeable to water and carbonaceous fuel and which is substantially impermeable to protons;

providing, on opposite sides of said barrier layer, first and second protonically conductive membranes;

providing sites in said barrier layer which allow protonically conductive contact between said protonically conductive membranes, said passages being large enough relative to barrier layer thickness to enable the protonically conductive contact through said barrier layer, while said passages are small enough to substantially prevent the passage of liquid therethrough; and

providing, on the surfaces of said membranes which are not in contact with said layer, first and second catalyst layers; and

providing, on the surfaces of said first and second catalyst layers which are not in contact with said membranes, first and second distribution layers.

16. (Previously Presented) The method as in claim 15 wherein said barrier layer comprises a microporous material.

17. (Currently Amended) [[The method as in claim 15 wherein]] A method of constructing a membrane electrode assembly for use in a direct oxidation fuel cell comprising the steps of:

providing a barrier layer of material which is substantially impermeable to water and carbonaceous fuel and which is substantially impermeable to protons, said barrier layer comprising a polyester microfilm with microperforations[[.]];

providing, on opposite sides of said barrier layer, first and second protonically conductive membranes; and

providing sites in said barrier layer which allow protonically conductive contact between said protonically conductive membranes.

18. (Currently Amended) [[The method as in claim 15 wherein]] A method of constructing a membrane electrode assembly for use in a direct oxidation fuel cell comprising the steps of:

providing a barrier layer of material which is substantially impermeable to water and carbonaceous fuel and which is substantially impermeable to protons, said barrier layer comprises a polyimide film with microperforations[[.]];

providing, on opposite sides of said barrier layer, first and second protonically conductive membranes; and

providing sites in said barrier layer which allow protonically conductive contact between said protonically conductive membranes.

19. (Currently Amended) A direction oxidation fuel cell comprising:

an anode;

a cathode;

a membrane electrode assembly, said assembly including a barrier layer of material that is substantially protonically non-conductive and which is substantially imperme-

able to water and fuel, first and second protonically conductive membranes disposed, respectively, on opposite surfaces of said barrier layer, said barrier layer having sites in said barrier layer that allow protonically conductive contact between said membranes, said passages being large enough relative to barrier layer thickness to enable the protonically conductive contact through said barrier layer, while said passages are small enough to substantially prevent the passage of liquid therethrough first and second catalysts disposed, respectively, on the surfaces of said membranes which are not in contact with said layer, and first and second diffusion material layers disposed, respectively, on the surfaces of said catalysts which are not in contact with said membranes; and

a housing in which said anode, cathode and assembly are disposed.

20. (Previously Presented) The fuel cell as in claim 19 wherein said barrier layer comprises a microporous material.

21. (Currently Amended) [[The fuel cell as in claim 19 wherein]] A direction oxidation fuel cell comprising:

an anode;

a cathode;

a membrane electrode assembly, said assembly including a barrier layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and fuel, said barrier layer comprising a polyester microfilm with microperforations[[.]], first and second protonically conductive membranes disposed, respectively, on opposite surfaces of said barrier layer, said barrier layer having sites in said barrier layer that allow protonically conductive contact between said membranes, said passages being large enough relative to barrier layer thickness to enable the protonically conductive contact through said barrier layer, while said passages are small enough to substantially prevent the passage of liquid therethrough first and second catalysts disposed, respectively, on the surfaces of said membranes which are not in contact with said layer, and first and second diffusion material layers disposed, respectively, on the surfaces of said catalysts which are not in contact with said membranes; and

a housing in which said anode, cathode and assembly are disposed.

22. (Currently Amended) [[The fuel cell as in claim 19 wherein]] A direction oxidation fuel cell comprising:

an anode;

a cathode;

a membrane electrode assembly, said assembly including a barrier layer of material that is substantially protonically non-conductive and which is substantially impermeable to water and fuel, said barrier layer comprises a polyimide film with microperforations[[.]], first and second protonically conductive membranes disposed, respectively, on opposite surfaces of said barrier layer, said barrier layer having sites in said barrier layer that allow protonically conductive contact between said membranes, said passages being large enough relative to barrier layer thickness to enable the protonically conductive contact through said barrier layer, while said passages are small enough to substantially prevent the passage of liquid therethrough, first and second catalysts disposed, respectively, on the surfaces of said membranes which are not in contact with said layer, and first and second diffusion material layers disposed, respectively, on the surfaces of said catalysts which are not in contact with said membranes; and

a housing in which said anode, cathode and assembly are disposed.

23. (Currently Amended) The fuel cell as in [[claim 19]] claim 22 wherein said fuel cell is a direct methanol fuel cell.